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Stereotactic Radiosurgery for Brainstem Arteriovenous Malformations: A Multicenter Study.

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Introduction

e management of brainstem arteriovenous malformations (bAVMs) is a formidable challenge. bAVMs harbor higher morbidity and mortality compared to other locations.

Methods

Six medical centers contributed data from 205 patients through the International Gamma Knife Research Foundation. Median age was 32 yr (6-81). Median nidus volume was 1.4 mL (0.1-69 mL). Favorable outcome (FO) was defined as AVM obliteration and no post-treatment hemorrhage or permanent symptomatic radiation-induced complications.

Results

Overall obliteration was reported in 65.4% (n = 134) at a mean follow-up of 69 mo. Obliteration was angiographically proven in 53.2% (n = 109) and on MRA in 12.2% (n = 25). Actuarial rate of obliteration at 2, 3, 5, 7, and 10 yr after SRS was 24.5%, 43.3%, 62.3%, 73%, and 81.8% respectively. Patients treated with a margin dose >20 Gy were more likely to achieve obliteration (P = .001). Obliteration occurred earlier in patients who received a higher prescribed margin dose (P = .05) and maximum dose (P = .041). Post-SRS hemorrhage occurred in 8.8% (n = 18). Annual postgamma knife latency period hemorrhage was 1.5%. Radiation-induced complications were radiologically evident in 35.6% (n = 73), symptomatic in 14.6% (n = 30), and permanent in 14.6% (n = 30, which included long-tract signs and new cranial nerve deficits). FO was achieved in 64.4% (n = 132). Predictors of an FO were a higher Virginia radiosurgery AVM scale score (P = .003), prior hemorrhage (P = .045), and a lower prescribed maximum dose (P = .006).

Conclusions

SRS for bAVMs results in obliteration and avoids permanent complications in the majority of patients.

Learning Objectives

To review the outcomes following stereotactic radiosurgery (SRS) of bAVMs in a multicenter study.

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